Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name • **2-Ethylhexanoyl Chloride**

Synonyms • 2-EHCL; Acid Chloride; C8H15ClO; CEHCL; Crude 2-Ethylhexanoyl Chloride; Octoic Chloride

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified use(s) • Chemical reagent; Pharmaceutical synthesis

Use(s) advised against • Do not use for products which come into contact with foodstuffs. Reason: Poisonous

1.3 Details of the supplier of the safety data sheet

Manufacturer • ALTIVIA Specialty Chemicals, LLC
1100 Louisiana St.
Suite 4800
Houston, TX 77002
www.altivia.com

Telephone (General) • +1 713-658-9000

Responsible Party - EU • Intertek France
12 Rue Alfred Kastler
71530 Fragnes
France

christian.gimenez@intertek.com

Telephone (General) • 33 (0) 385 99 1274

Telephone (General) • 33 385 99 1288

1.4 Emergency telephone number

Manufacturer • MAIN +1 281-842-6230
BACKUP +1 281-471-5147 ext 6230

Section 2: Hazards Identification

EU/EEC

According to Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP • Acute Toxicity Oral 4 - H302
Skin Corrosion 1B - H314
Serious Eye Damage 1 - H318
Acute Toxicity Inhalation 2 - H330

DSD/DPD • Harmful (Xn)

Toxic (T)
Corrosive (C)
R22, R26, R34

2.2 Label Elements

CLP

DANGER

Hazard statements

- H302 - Harmful if swallowed
- H314 - Causes severe skin burns and eye damage.
- H318 - Causes serious eye damage
- H330 - Fatal if inhaled

Precautionary statements

Prevention

- P260 - Do not breathe mist/vapours/spray.
- P264 - Wash thoroughly after handling.
- P270 - Do not eat, drink or smoke when using this product.
- P271 - Use only outdoors or in a well-ventilated area.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- P284 - Wear respiratory protection.

Response

- P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P310 - Immediately call a POISON CENTER or doctor/physician.
- P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P363 - Wash contaminated clothing before reuse.
- P321 - Specific treatment, see supplemental first aid information.
- P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P301+P312 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician if you feel unwell.
- P330 - Rinse mouth.
- P331 - Do NOT induce vomiting.

Storage/Disposal

- P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
- P405 - Store locked up.
- P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD

Risk phrases

- R22 - Harmful if swallowed.
- R26 - Very toxic by inhalation.
- R34 - Causes burns.

Safety phrases

- S36 - Wear suitable protective clothing.
- S37 - Wear suitable gloves.
- S39 - Wear eye/face protection.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

2.3 Other Hazards

CLP

- Contact with water produces toxic and corrosive fumes -Hydrogen chloride HCl) According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD

- Contact with water produces toxic and corrosive fumes -Hydrogen chloride HCl) This product is considered dangerous according to the European Directive 67/548/EEC.

UN GHS

According to Third Revised Edition

2.1 Classification of the substance or mixture

UN GHS

- Flammable Liquids 4 - H227
  Acute Toxicity Oral 4 - H302
  Acute Toxicity Dermal 5 - H313
  Skin Corrosion 1B - H314
  Serious Eye Damage 1 - H318
  Acute Toxicity Inhalation 2 - H330
  Reproductive Toxicity 2 - H361

2.2 Label elements

UN GHS

DANGER

Hazard statements

- H227 - Combustible liquid
  H302 - Harmful if swallowed
  H313 - May be harmful in contact with skin
  H314 - Causes severe skin burns and eye damage.
  H318 - Causes serious eye damage
  H330 - Fatal if inhaled
  H361 - Suspected of damaging fertility or the unborn child.

Precautionary statements

Prevention

- P201 - Obtain special instructions before use.
  P202 - Do not handle until all safety precautions have been read and understood.
  P210 - Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking.
  P260 - Do not breathe dust.
  P264 - Wash thoroughly after handling.
  P270 - Do not eat, drink or smoke when using this product.
  P271 - Use only outdoors or in a well-ventilated area.
  P280 - Wear protective gloves/protective clothing/eye protection/face protection.
  P281 - Use personal protective equipment as required.

Response

- P370+P378 - In case of fire: Use appropriate media for extinction.
  P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
  P310 - Immediately call a POISON CENTER or doctor/physician.
  P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
  P363 - Wash contaminated clothing before reuse.
  P321 - Specific treatment, see supplemental first aid information.
  P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P301+P312 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician if you feel unwell.
  P330 - Rinse mouth.
  P331 - Do NOT induce vomiting.
  P308+P313 - IF exposed or concerned: Get medical advice/attention.

Storage/Disposal

- P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
  P235 - Keep cool.
  P405 - Store locked up.
  P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Supplemental information

- (Dermal) 96.82 percent of this product consists of an ingredient of unknown toxicity.

2.3 Other hazards

UN GHS

- Contact with water produces toxic and corrosive fumes -Hydrogen chloride HCl)
According to the Globally Harmonized System for Classification and Labeling (GHS) this product is considered hazardous.

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012

- Flammable Liquids 4 - H227
Acute Toxicity Oral 4 - H302
Skin Corrosion 1B - H314
Serious Eye Damage 1 - H318
Acute Toxicity Inhalation 2 - H330
Reproductive Toxicity 2 - H361
Hazards Not Otherwise Classified - Physical Hazard - Contact with water produces toxic and corrosive fumes -Hydrogen chloride (HCl)

2.2 Label elements

OSHA HCS 2012

DANGER

Hazard statements

- Combustible liquid - H227
Harmful if swallowed - H302
Causes severe skin burns and eye damage. - H314
Causes serious eye damage - H318
Fatal if inhaled - H330
Suspected of damaging fertility or the unborn child. - H361

Precautionary statements

Prevention

- Obtain special instructions before use. - P201
Do not handle until all safety precautions have been read and understood. - P202
Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. - P210
Do not breathe mist/vapours/spray. - P260
Wash thoroughly after handling. - P264
Do not eat, drink or smoke when using this product. - P270
Use only outdoors or in a well-ventilated area. - P271
Wear protective gloves/protective clothing/eye protection/face protection. - P280
Use personal protective equipment as required. - P281

Response

- In case of fire: Use appropriate media for extinction. - P370+P378
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. - P304+P340
Immediately call a POISON CENTER or doctor/physician. - P310
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. - P303+P361+P353
Wash contaminated clothing before reuse. - P363
Specific treatment, see supplemental first aid information. - P321
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - P305+P351+P338
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician if you feel unwell. - P301+P312
Rinse mouth. - P330
Do NOT induce vomiting. - P331
IF exposed or concerned: Get medical advice/attention. - P308+P313

Storage/Disposal

- Store in a well-ventilated place. Keep container tightly closed. - P403+P233
Keep cool. - P235
Store locked up. - P405
Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. - P501

2.3 Other hazards

OSHA HCS 2012

- Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

2.1 Classification of the substance or mixture

WHMIS

- Combustible Liquids - B3
  Very Toxic - D1A
  Corrosive - E

2.2 Label elements

WHMIS

- Combustible Liquids - B3
  Very Toxic - D1A
  Corrosive - E

2.3 Other hazards

WHMIS

- Contact with water produces toxic and corrosive fumes -Hydrogen chloride HCl)
  In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

Composition				
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**
Hexanoyl chloride, 2-ethyl-	**CAS:**760-67-8 **EINECS:**212-081-1	> 97%	Inhalation-Rat LC50 • 1260 mg/m³	**UN GHS:** Acute Tox. 4 (oral); Acute Tox. 2 (inhl); Skin Corr. 1B; Eye Dam. 1 **EU DSD/DPD:** Self Classified: T+ R26 Xn R22 C R34 **EU CLP:** Self Classified: Acute Tox. 4, H302; Acute Tox. 2, H330; Skin Corr. 1B, H314; Eye Dam. 1, H318 **OSHA HCS 2012:** Acute Tox. 4 (oral); Acute Tox. 2 (inhl); Skin Corr. 1B; Eye Dam. 1
Hydrochloric acid	**CAS:**7647-01-0 **EC Number:**231-595-7 **EU Index:**017-002-00-2	< 1%	Inhalation-Rat LC50 • 3124 ppm 1 Hour(s) Ingestion/Oral-Rabbit LD50 • 900 mg/kg	**UN GHS:** Skin Corr. 1B; Eye Corr. 1 **EU DSD/DPD:** Annex VI, Table 3.2: T R23 C R35 **EU CLP:** Annex VI, Table 3.1: Skin Corr. 1B, H314; STOT SE 3: Resp. Irrit., H335 **OSHA HCS 2012:** Skin Corr. 1B; Eye Corr. 1
2-Ethylhexanoic Anhydride	**CAS:**36765-89-6 **EINECS:**253-195-1	< 1%	NDA	**UN GHS:** Not Classified **EU DSD/DPD:** Not Classified **EU CLP:** Not Classified **OSHA HCS 2012:** Not Classified
2-ethyl-Hexanoic acid	**CAS:**149-57-5 **EC Number:**205-743-6 **EU Index:**607-230-00-6	< 1%	Ingestion/Oral-Rat LD50 • 3 g/kg Skin-Rabbit LD50 • 1260 µL/kg	**UN GHS:** Repr 2; Eye Irrit. 2; Acute Tox. 4 (skn, oral) **EU DSD/DPD:** Annex VI, Table 3.2: Repr.Cat.3 R63 **EU CLP:** Annex VI, Table 3.1: Repr. 2, H361d **OSHA HCS 2012:** Repr. 2; Eye Irrit. 2; Acute Tox. 4 (skn, oral)

2-Pyrrolidinone, 1-octyl-	**CAS:**2687-94-7 **EC Number:**403-700-8 **EU Index:**613-098-00-0	< 0.3%	Ingestion/Oral-Rat LD50 • 2050 mg/kg Skin-Rabbit LD50 • >2 g/kg	**UN GHS:** Skin Corr. 1C; Eye Dam. 1C **EU DSD/DPD:** Annex VI, Table 3.2: C R34 N R51-53 **EU CLP:** Annex VI, Table 3.1: Skin Corr. 1B, H314; Aquatic Chronic 2, H411 **OSHA HCS 2012:** Skin Corr. 1C; Eye Dam. 1C
Phosgene	**CAS:**75-44-5 **EC Number:**200-870-3 **EU Index:**006-002-00-8	< 0.2%	NDA	**UN GHS:** Press. Gas - Liq.; Eye Dam. 1; Skin Corr. 1B; Acute Tox. 1 (inhl) **EU DSD/DPD:** Annex VI, Table 3.2: T+ R26 C R34 **EU CLP:** Annex VI, Table 3.1: Press. Gas - Liq., H280; Acute Tox. 2, H330; Skin Corr., H314 **OSHA HCS 2012:** Press. Gas - Liq.; Eye Dam. 1; Skin Corr. 1B; Acute Tox. 1 (inhl)

3.2 Mixtures

- Material does not meet the criteria of a mixture in accordance with Regulation (EC) No 1272/2008.

See Section 16 for full text of H-statements and R-phrases.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- Move victim to fresh air. Administer oxygen if breathing is difficult. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give artificial respiration if victim is not breathing.

Skin
- For minor skin contact, avoid spreading material on unaffected skin. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Remove and isolate contaminated clothing. Get medical attention immediately.

Eye
- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation develops and persists, get medical attention.

Ingestion
- Do NOT induce vomiting. Do not use mouth-to-mouth method if victim ingested the substance. Obtain medical attention immediately if ingested.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media
- In case of fire, use dry chemical powder, Carbon dioxide, Foam.

Unsuitable Extinguishing Media
- DO NOT use water.

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- Containers may explode when heated.
Vapor explosion hazard indoors, outdoors or in sewers.
HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
Many liquids are lighter than water.

Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
Runoff to sewer may create fire or explosion hazard.
Vapors may form explosive mixtures with air.
Vapors may travel to source of ignition and flash back.
Hydrolyzes exothermically in water, liberating hydrogen chloride vapors.

Hazardous Combustion Products

- Decomposition products may include the following materials: Carbon oxides. Hydrogen chloride (HCl). Phosgene gas.

5.3 Advice for firefighters

- Structural firefighters' protective clothing will only provide limited protection.
Wear positive pressure self-contained breathing apparatus (SCBA).
Move containers from fire area if you can do it without risk.
LARGE FIRES: Cool containers with flooding quantities of water until well after fire is out.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions

- Ventilate enclosed areas. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not breathe mist, vapors, spray. CAUTION: Victim may be a source of contamination.

Emergency Procedures

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. LARGE SPILL: Consider initial downwind evacuation for at least 300 meters (1000 feet) Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Do not get water inside container. Ventilate closed spaces before entering.

6.2 Environmental precautions

- Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Stop leak if you can do it without risk.
Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
Use clean non-sparking tools to collect absorbed material.
All equipment used when handling the product must be grounded.
A vapor suppressing foam may be used to reduce vapors.
LARGE SPILLS: Dike far ahead of liquid spill for later disposal.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Handle and open container with care. Use only with adequate ventilation. Avoid contact with heat and ignition sources. All equipment used when handling the product must be grounded. Use only non-sparking tools. Take precautionary measures against static charges. Protect from moisture. Reacts with water, producing toxic and corrosive fumes. Wear appropriate personal protective equipment, avoid direct contact. Do not ingest. Do not breathe gas, mist, vapors, spray. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Ventilate enclosed areas. Keep only in the original container. Keep container tightly

closed. Avoid contact with heat and ignition sources and oxidizers. Store in a cool, dry, well-ventilated place. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines						
	Result	**ACGIH**	**Canada British Columbia**	**Canada Ontario**	**Canada Quebec**	**NIOSH**
Phosgene (75-44-5)	TWAs	0.1 ppm TWA	0.1 ppm TWA	0.1 ppm TWA	0.1 ppm TWAEV; 0.40 mg/m3 TWAEV	0.1 ppm TWA; 0.4 mg/m3 TWA
	Ceilings	Not established	Not established	Not established	Not established	0.2 ppm Ceiling (15 min); 0.8 mg/m3 Ceiling (15 min)
Hydrochloric acid (7647-01-0)	Ceilings	2 ppm Ceiling	2 ppm Ceiling	2 ppm Ceiling	5 ppm Ceiling; 7.5 mg/m3 Ceiling	5 ppm Ceiling; 7 mg/m3 Ceiling
2-ethyl-Hexanoic acid (149-57-5)	TWAs	5 mg/m3 TWA (inhalable fraction and vapor)	5 mg/m3 TWA (aerosol, inhalable, and vapour)	5 mg/m3 TWA (inhalable fraction and vapor)	Not established	Not established

Exposure Limits/Guidelines (Con't.)		
	Result	**OSHA**
Phosgene (75-44-5)	TWAs	0.1 ppm TWA; 0.4 mg/m3 TWA
Hydrochloric acid (7647-01-0)	Ceilings	5 ppm Ceiling; 7 mg/m3 Ceiling

8.2 Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof electrical/ventilating/lighting/equipment.

Personal Protective Equipment

Respiratory

- If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Eye/Face

- Wear chemical splash goggles and face shield.

Skin/Body

- Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. HANDS: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Environmental Exposure Controls

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways. Follow

best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene
NIOSH = National Institute of Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
TWAEV = Time-Weighted Average Exposure Value
TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Liquid	Appearance/Description	Colorless to light yellow liquid with a pungent, mustard-like odor.
Color	Colorless to light yellow.	Odor	Pungent, mustard-like odor.
Odor Threshold	No data available		
General Properties			
Boiling Point	182.5 C(360.5 F) @760 mmHg	Melting Point	-17.74 C(0.068 F)
Decomposition Temperature	No data available	pH	Acidic
Specific Gravity/Relative Density	0.95 Water=1 @ 20 C(68 F)	Density	7.93 lbs/gal
Water Solubility	Reacts	Viscosity	No data available
Explosive Properties	No data available	Oxidizing Properties:	No data available
Volatility			
Vapor Pressure	0.72 mmHg (torr) @ 20 C(68 F)	Vapor Density	No data available
Evaporation Rate	No data available	VOC (Vol.)	100 %
Volatiles (Vol.)	100 %		
Flammability			
Flash Point	82 C(179.6 F) CC (Closed Cup)	UEL	No data available
LEL	No data available	Autoignition	No data available
Flammability (solid, gas)	Not relevant.		
Environmental			
Octanol/Water Partition coefficient	2.401 Kow @ 20°C		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under recommended storage and handling conditions.

10.3 Possibility of hazardous reactions

- Under normal conditions of storage and use, hazardous polymerization will not occur.

10.4 Conditions to avoid

- Excess heat, sparks, open flame. Protect from moisture. Avoid contamination by any

source including metals, dust and organic materials.

10.5 Incompatible materials

- Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids, moisture, water, alcohols, amines, rust. Activated carbon. Metal salt.

10.6 Hazardous decomposition products

- Decomposition products may include the following materials: carbon oxides, Hydrogen chloride (HCl)., Phosgene gas.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Hexanoyl chloride, 2-ethyl- (> 97%)	760-67-8	**Acute Toxicity:** Inhalation-Rat LC50 • 1260 mg/m³; *Lungs, Thorax, or Respiration*:**Other changes**
Impurities, Stabilizers, etc...		
2-ethyl-Hexanoic acid (< 1%)	149-57-5	**Acute Toxicity:** Skin-Rabbit LD50 • 1260 µL/kg; **Irritation:** Eye-Rabbit • 20 mg • Severe irritation; Skin-Rabbit • 450 mg-Open • Mild irritation; **Multi-dose Toxicity:** Ingestion/Oral-Rat TDLo • 8800 mg/kg 2 Week(s)-Intermittent; *Behavioral*:**Somnolence (general depressed activity)**; *Liver*:**Changes in liver weight**; *Skin and Appendages:Other*:**Hair**; **Reproductive:** Ingestion/Oral-Rat TDLo • 5 g/kg (6-15D preg); *Reproductive Effects:Effects on Embryo or Fetus*:**Fetotoxicity (except death, e.g., stunted fetus)**
2-Pyrrolidinone, 1-octyl- (< 0.3%)	2687-94-7	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 2050 mg/kg; *Gastrointestinal*:**Other changes**; *Liver*:**Other changes**; *Kidney, Ureter, and Bladder*:**Other changes**; Skin-Rabbit LD50 • >2 g/kg; **Irritation:** Skin-Rabbit • 500 mg 24 Hour(s) • Severe irritation; **Multi-dose Toxicity:** Ingestion/Oral-Rat TDLo • 8960 mg/kg 28 Day(s)-Intermittent; *Blood*:**Changes in leucocyte (WBC) count**; *Nutritional and Gross Metabolic:Gross Metabolite Changes*:**Weight loss or decreased weight gain**; *Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels*:**Transaminases**
Phosgene (< 0.2%)	75-44-5	**Multi-dose Toxicity:** Inhalation-Rat TCLo • 200 ppb 6 Hour(s) 4 Week(s)-Intermittent; *Lungs, Thorax, or Respiration*:**Structural or functional change in trachea or bronchi**; *Lungs, Thorax, or Respiration*:**Changes in lung weight**
Hydrochloric acid (< 1%)	7647-01-0	**Acute Toxicity:** Inhalation-Rat LC50 • 7004 mg/m³ 30 Minute(s); *Lungs, Thorax, or Respiration*:**Acute pulmonary edema**; **Reproductive:** Inhalation-Rat TCLo • 450 mg/m³ 1 Hour(s)(1D pre); *Reproductive Effects:Effects on Embryo or Fetus*:**Fetotoxicity (except death, e.g., stunted fetus)**; *Reproductive Effects:Specific Developmental Abnormalities*:**Homeostasis**

GHS Properties	Classification
Acute toxicity	**EU/CLP** • Acute Toxicity - Inhalation 2 - ATEmix(inhl)=0.3253 mg/L (mist); Acute Toxicity - Oral 4 - ATEmix(oral)=1456 mg/kg **OSHA HCS 2012** • Acute Toxicity - Inhalation 2 - ATEmix(inhl)=0.3253 mg/L (mist); Acute Toxicity - Oral 4 - ATEmix(oral)=1456 mg/kg **UN GHS** • Acute Toxicity - Dermal 5; Acute Toxicity - Inhalation 2 - ATEmix(inhl)=0.3253 mg/L (mist); Acute Toxicity - Oral 4 - ATEmix(oral)=1456 mg/kg
Aspiration Hazard	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Carcinogenicity	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available

Germ Cell Mutagenicity	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Skin corrosion/Irritation	**EU/CLP** • Skin Corrosion 1B **OSHA HCS 2012** • Skin Corrosion 1B **UN GHS** • Skin Corrosion 1B
Skin sensitization	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
STOT-RE	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
STOT-SE	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Toxicity for Reproduction	**EU/CLP** • No data available **OSHA HCS 2012** • Toxic to Reproduction 2 **UN GHS** • Toxic to Reproduction 2
Respiratory sensitization	**EU/CLP** • No data available **OSHA HCS 2012** • No data available **UN GHS** • No data available
Serious eye damage/Irritation	**EU/CLP** • Serious Eye Damage 1 **OSHA HCS 2012** • Serious Eye Damage 1 **UN GHS** • Serious Eye Damage 1

Potential Health Effects

Inhalation

Acute (Immediate)
- Fatal if inhaled. May cause corrosive burns - irreversible damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive fumes may cause bronchial irritation with chronic cough.

Skin

Acute (Immediate)
- May be harmful in contact with skin. Causes severe skin burns and eye damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials will cause dermatitis.

Eye

Acute (Immediate)
- Causes serious eye damage. Animal testing has shown 2-Ethylhexanoyl Chloride (2-EHCL) to be mildly irritating in both washed and nonwashed eyes. Eye contact with this material will produce immediate irritation. However, based upon experimental animal data, if the chemical is immediately washed from the eyes, permanent ocular tissue damage should not occur.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials or fumes may cause conjunctivitis.

Ingestion

Acute (Immediate)
- Harmful if swallowed. May cause irreversible damage to mucous membranes.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials or fumes may cause gastrointestinal distrubances.

Reproductive Effects
- Animal tests show that 2-ethyl-Hexanoic acid (149-57-5) possibly causes toxicity to human reproduction or development.

Key to abbreviations

LC = Lethal Concentration

LD = Lethal Dose

TC = Toxic Concentration
TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

2-Ethylhexanoyl Chloride					
Dosage	**Species**	**Duration**	**Results**	**Exposure Conditions**	**Comments**
85.4 mg/L	**Crustacea:** Daphnia Magna	48 Hour(s)	EC50	Fresh water	Hexanoyl chloride, 2-ethyl-
40.6 mg/L	**Aquatic Plant(s):** Scenedesmus Subspicatus	96 Hour(s)	EC50	Fresh water	Hexanoyl chloride, 2-ethyl-

12.2 Persistence and degradability

- Bioconcentration factor : 14.09 (calculated.)

12.3 Bioaccumulative potential

- This product shows a low bioaccumulation potential.

12.4 Mobility in Soil

- Water solubility: Highly reactive with water. A water-air, model level III fugacity study (environmental transport) predicts the following results: Air 14.1%, Water 50.1%, Soil 35.6%, Sediment 0.234%.

12.5 Results of PBT and vPvB assessment

- No PBT and vPvB assessment has been conducted.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN2927	Toxic liquid, Corrosive, organic, n.o.s. (2-ethylhexanoyl chloride)	6.1,8	II	NDA
TDG	UN2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S. (2-ethylhexan chloride)	6.1,8	II	Potential Marine Pollutant
IMO/IMDG	UN2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S. (2-ethylhexan chloride)	6.1,8	II	NDA
IATA/ICAO	UN2927	Toxic liquid, Corrosive, organic, n.o.s. (2-ethylhexanoyl chloride)	6.1,8	II	NDA

14.6 Special precautions for
- None specified.

user

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

- Data lacking.

Section 15 - Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications

- Acute, Chronic, Fire

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**EU EINECS**	**EU ELNICS**	**TSCA**
2-ethyl-Hexanoic acid	149-57-5	Yes	No	Yes	No	Yes
2-Ethylhexanoic Anhydride	36765-89-6	No	No	Yes	No	No
2-Pyrrolidinone, 1-octyl-	2687-94-7	Yes	No	No	Yes	Yes
Hexanoyl chloride, 2-ethyl-	760-67-8	No	Yes	Yes	No	Yes
Hydrochloric acid	7647-01-0	Yes	No	Yes	No	Yes
Phosgene	75-44-5	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Phosgene	75-44-5	A, D1A, E
• Hydrochloric acid	7647-01-0	A, D1A, E (listed under Hydrogen chloride); D1A, E; E (0.036% in aqueous solution, 0.36% in aqueous solution, 3.6% in aqueous solution); D1B, E (28% in aqueous solution); D1A, E (31.45% in aqueous solution, 35.2% in aqueous solution)
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	E
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

Canada - WHMIS - Ingredient Disclosure List

• Phosgene	75-44-5	1 %
• Hydrochloric acid	7647-01-0	1 %
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	1 %
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

Environment

Canada - CEPA - Priority Substances List

• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Phosgene	75-44-5	100 lb TQ
• Hydrochloric acid	7647-01-0	5000 lb TQ; 5000 lb TQ (anhydrous)
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Phosgene	75-44-5	
• Hydrochloric acid	7647-01-0	
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Phosgene	75-44-5	10 lb final RQ; 4.54 kg final RQ
• Hydrochloric acid	7647-01-0	5000 lb final RQ; 2270 kg final RQ
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Phosgene	75-44-5	10 lb EPCRA RQ
• Hydrochloric acid	7647-01-0	5000 lb EPCRA RQ (gas only)
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Phosgene	75-44-5	10 lb TPQ
• Hydrochloric acid	7647-01-0	500 lb TPQ (gas only)
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Phosgene	75-44-5	1.0 % de minimis concentration
• Hydrochloric acid	7647-01-0	1.0 % de minimis concentration (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - TSCA (Toxic Substances Control Act) - Section 12(b) - Export Notification

• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity		
• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	developmental toxicity, initial date 8/7/09
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed
U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed
U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)		
• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Female		
• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Male		
• Phosgene	75-44-5	Not Listed
• Hydrochloric acid	7647-01-0	Not Listed
• 2-Pyrrolidinone, 1-octyl-	2687-94-7	Not Listed
• 2-ethyl-Hexanoic acid	149-57-5	Not Listed
• Hexanoyl chloride, 2-ethyl-	760-67-8	Not Listed
• 2-Ethylhexanoic Anhydride	36765-89-6	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

15.3 Other Information

- WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Section 16 - Other Information

Relevant Phrases (code & full text)

- H280 - Contains gas under pressure; may explode if heated
  H335 - May cause respiratory irritation

H361d - Suspected of damaging the unborn child.
H411 - Toxic to aquatic life with long lasting effects

R23 - Toxic by inhalation.
R35 - Causes severe burns.
R51 - Toxic to aquatic organisms.
R53 - May cause long-term adverse effects in the aquatic environment.
R63 - Possible risk of harm to the unborn child.

Last Revision Date

- 22/September/2014

Preparation Date

- 22/September/2014

Disclaimer/Statement of Liability

- The technical data given herein is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release, and is not to be considered a warranty or quality specification. No guarantee is being given as to the end use performance. The product is sold on the basis that buyers test the product for their specific purposes. This information related to the material designated and may not be valid for such material used in combination with any other materials or in any process.

Key to abbreviations

NDA = No data available